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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,573	11/02/2001	Michael H. Zimmerman	60 SD 00806	2732
21269	7590	07/09/2004	EXAMINER	
PEPPER HAMILTON LLP ONE MELLON CENTER, 50TH FLOOR 500 GRANT STREET PITTSBURGH, PA 15219			LANGEL, WAYNE A	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/001573

Applicant(s)

Zimmerman et al

Examiner

Langel

Group Art Unit

1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

☒ Responsive to communication(s) filed on 5-14-04

☒ This action is **FINAL**.

- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

☒ Claim(s) 1-3, 8, 9, 11, 15 and 19-28 is/are pending in the application.

Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-3, 8, 9, 11, 15 and 19-28 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some\* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other \_\_\_\_\_

Office Action Summary

Art Unit 1754

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 8, 9, 11, 15, 20-24 and 26-28 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over French 2686101, for the reasons given in the last Office action. Applicant's argument, that the French patent is silent as to which method conditions are necessary to result in a cubic boron nitride product that has improved toughness properties and an oxygen content of less than 300 ppm, is not convincing. Applicant's specification suggests

Art Unit 1754

on page 3, lines 29-34 that any amount of oxygen getter greater than about 0.005 weight percent of the feedstock would result in a lowering of the oxygen content of the cubic boron nitride. Accordingly the amount of aluminum or titanium present in the process of the French patent would inherently improve the toughness of the cubic boron nitride product. Applicant's argument, that it is not obvious from a reading of the French patent that a HP/HT process in the presence of an oxygen getter effectively increases the toughness of the cubic boron nitride product while decreasing the oxygen content of the cubic boron nitride product, is not convincing, since the rejection is based on the inherency doctrine, so it is irrelevant as to whether this concept would be obvious from a reading of the French patent.

Claims 3, 19 and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over French 2686101. French '101 is relied upon as discussed hereinbefore. It would be prima facie obvious to employ the titanium or aluminum in an amount of between about 0.005 and 0.5 weight percent in the reaction mixture of the French patent, since it would be within the skill of one of ordinary skill in the art to determine the suitable or optimum amount of the aluminum or titanium, and there is no evidence on record of unexpected results which would emanate from the use of the amounts recited in claims 3, 19 and 25, as opposed to amounts

outside such range.

Claims 1-3, 8, 9, 11, 15 and 19-28 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over British 2,058,840, for the reasons given in the last Office action. Applicant's argument, that the British patent is silent as to which method conditions are necessary to result in a cubic boron nitride product that has improved toughness properties and an oxygen content of less than 300 ppm, is not convincing. Applicant's specification suggests on page 3, lines 29-34 that an amount of the oxygen getter of between about 0.005 and 0.5 weight percent of the feedstock would be suitable to lower the oxygen content of the cubic boron nitride product to the desired level. The British patent discloses in the Abstract that 0.1% by weight of the titanium nitride may be employed in the process. Accordingly the process of British '840 would inherently result in a cubic boron nitride product that has improved toughness properties and an oxygen content of less than 300 ppm, since the reference discloses an amount of titanium nitride of 0.1% by weight in the reaction mixture, which is taught by applicant's specification to be a desirable amount to employ to lower the oxygen content of the cubic boron nitride product. Applicant's argument, that it is not obvious from the British patent that a HP/HT process in the

Art Unit 1754

presence of an oxygen getter would effectively increase the toughness of the cubic boron nitride product while decreasing the oxygen content of the cubic boron nitride product, is not convincing, since this fact is irrelevant in that the rejection is based on the inherency doctrine. Regarding claims 23-28, the requirement that the oxygen getter comprises titanium, would not overcome British '840, since claims 23-28 do not require that the titanium be elemental titanium, but rather embrace the titanium nitride employed in the process of British '840.

Claims 1-3, 8, 9, 11, 15 and 19-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Japanese 58060604, for the reasons given in the last Office action. Applicant's argument, that the Japanese patent does not describe any relationship between the use of the transition metals as oxygen getters and a cubic boron nitride crystal having low oxygen concentration, is not convincing. The Japanese reference discloses in the Abstract that the amount of the silicon or aluminum may be from 2 to 15 parts by weight of the hexagonal boron nitride. Such amounts of aluminum or silicon would inherently result in improved toughness of the cubic boron nitride product and an oxygen content of less than about 300 ppm, in view of the disclosure on page 3, lines 29-34 of applicant's specification.

Art Unit 1754

Claims 1, 8, 9, 11, 15, 21 and 22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the article by Sato et al., for the reasons given in the last Office action. Applicant's argument, that nowhere are the presently claimed oxygen getters described or suggested in Sato et al., is not convincing, since these claims do not recite any specific oxygen getter, but rather embrace the magnesium nitride employed by Sato et al. It would be expected that the process of Sato et al. would result in a cubic boron nitride product having an oxygen content of less than about 300 ppm, since Sato et al. teach that magnesium oxide precipitated as a by-product in the system. Accordingly it would be expected that the cubic boron nitride product would have less oxygen due to the precipitation of the oxygen as magnesium oxide.

Claims 3 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the article by Sato et al. It would be prima facie obvious to employ between about 0.005 and 0.5 weight percent of the magnesium nitride in the reaction mixture in the process of Sato et al., since it would be within the skill of one of ordinary skill in the art to determine a suitable or optimum amount of the magnesium nitride. There is no evidence on record of unexpected results which would emanate from the amounts of

Art Unit 1754

magnesium nitride as recited in claims 3 and 19, as opposed to amounts outside such range.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --  
(e) The invention was described in (1) an application for patent, published under Section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 8, 9, 11, 15 and 19-22 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shioi et al. '996, for the reasons given in the last Office action. Applicant's argument, that Shioi et al. '996 does not describe any relationship between the use of an oxygen getter and a cubic boron nitride product having low oxygen concentration as presently claimed in claims 1 and 15, is not convincing. Shioi et al. '996 teaches in the paragraph bridging columns 3 and 4 that the amount of the silicon source is preferably from 0.01 to 0.8 parts, based on 100 parts of



hexagonal boron nitride. Accordingly the cubic boron nitride product of Shioi et al. '996 would inherently have an oxygen content of less than 300 ppm, since applicant's specification teaches on page 3, lines 29-34 that such an amount of the silicon would result in a boron nitride product having an oxygen level below 300 ppm.

Claims 1-3, 8, 9, 11, 15 and 19-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Taylor et al., for the reasons given in the last Office action. Applicant's argument, that Taylor et al. do not provide any relationship between the use of the transition metals as oxygen getters and a cubic boron nitride crystal having low oxygen concentration as presently claimed in claims 1 and 15, is not convincing. Taylor et al. disclose at column 3, lines 13-34 that the preferred mixture consists of 99.5 weight percent boron nitride and 0.5 weight percent aluminum. Such an amount of aluminum would inherently result in a cubic boron nitride product having an oxygen content of less than 300 ppm, in view of page 3, lines 29-34 of applicant's specification, which suggests that an amount of aluminum of 0.5 weight percent would result in a cubic boron nitride product having such low oxygen levels.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the

Serial No. 10/001,573

-9-

Art Unit 1754

extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (571) 272-1353. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (571) 272-1358. The fax phone number for this Group is (703) 872-9306.

Information regarding the status of an application may be

Serial No. 10/001,573

-10-

Art Unit 1754

obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or public PAIR. Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WAL:cdc

July 7, 2004

*Wayne A. Langel*  
WAYNE A. LANGEL  
PRIMARY EXAMINER